Diksha Gautam

Master of Science
in Physics
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GitHub

Degree	Institute	Board / University	CGPA/Percentage	Year
MSc Physics	IISER TVM, TVM,Kerala	Autonomous	6.4 (Till 3rd Sem)	2021-2023
BSc Physics	BK Birla college	Maharashtra	9.12	2018-2021
HSC	BK Birla college	Maharashtra	80.4%	2016-2018
Matriculation	Lok Kalyan Public school	Maharashtra	91.4%	2016

SCHOLASTIC ACHIEVEMENTS

- Qualified the entrance exam and interviews conducted by IISER TVM for their MSc program *(2021)*
- Qualified the first round of entrance exam conducted by IISER Kolkata for MSc program *(2021)*
- Cleared IIT JAM with rank 5057 in PHYSICS *(2021)*
- Qualified JEE Mains *(2017)*
- Qualified Maharashtra CET *(2017)*
- Selected for poster presentation in the Mumbai University Intercollegiate Research Convention- Aavishkar *(2019)*

KEY PROJECTS

- **Optical realization of quantum communication protocols | MSc Major Project** *(Apr 2019 - Jul 2019)*
  Guide: Prof. Dr. Debashis Saha (Physics Faculty IISER TVM)
  - Designing optical setups of quantum communication protocols- Quantum random access code, Quantum teleportation, Quantum key distribution
  - Long distance secure communication using Optical qubits.

- **Radiative transfer model- sbdart** *(Feb- April 2023)*
  - Finding incident spectral irradiance at the top of atmosphere and analysis
  - Solar and terrestrial emission spectra for a specific location
  - Observing the variations in the Outgoing longwave radiation at different surface temperatures by changing the concentration of greenhouse gases.

- **Satellite Remote sensing** *(Feb-April 2023)*
  - Estimate the mean sea-surface (brightness)temperature, after clearing clouds and land surface,from the satellite radiometer data.

- **Nanotechnology Project** *(Sep 2022- Dec 2022)*
  Guide: Prof. Dr. Vinayak Kamble (Physics Faculty IISER TVM)
  - Graphene Synthesis on SiO2 using pulsed laser deposition
  - Synthesis of Carbon Nanotube using Chemial Vapour Deposition

- **Seminar Presentation, Paper review | IISER TVM** *(Nov 2018 - Feb 2019)*
  - Instability of the Massive Klein Gordon field on the Kerr spacetime
  - Instability of the scalar field in the vicinity of a rotating Black hole
  - Review of work by Sam R.Dolan (Phys.Rev.D76,084001 Published 3 October 2007)

- **Seminar Presentation, Paper review | IISER TVM** *(Apr 2019 - Jul 2019)*
  - Is Quantum Tunneling faster than light?
  - Experimental setup for a customized Larmor clock
  - Review of work P.C.W. Davies

- **Machine Learning REVIEW report| BSc final project** *(Coursera course by Andrew Ng, 2019)*

- Linear Regression, Logistics regression, Regularization, Neural Networks, System designing, Support vector machines, Clustering, Dimentionality reduction, Anomaly detection, Recommender systems

- **Solving a Rubik's cube using Group Theory** *(Nov 2018 - Feb 2019)*
  - Using Old Pochmann method and common Rubik's cube algorithms for solving edges and corners.
  - The functions applied do not violate the laws of Group Theory.
  - This method doesn't require for one to remember where each piece was.

WORKSHOPS AND CONFERENCES

- School on quantum technologies using atoms and ions | IISER TVM *(Feb 2023)*
- Frontier Symposium in Physics [FS-PHYSICS 2022]| IISER TVM *(Apr 2022)*
- International Workshop for Nano-Engineered Material [IWNEM 2023] | IISER TVM *(Feb 2023)*
- International Conference on Main Group Synthesis and Catalysis 2023| IISER TVM *(Feb 2023)*

SELF CODING PROJECTS

- **RL Simulation** *(Mar 2021 - Jun 2021)*
  - Tested RL agents on Classic Control & Toy Text *OpenAI gym* environments to examine performance
  - Trained many RL agents on these environments - DQN & QLearing algorithms
- **Genetic Experiments** *(Nov 2019 - Jan 2020)*
  - Solved Travelling Salesperson Problem using Genetic Algorithms and traced its routes across generations
  - Designed algorithm to breed arrays of DNA and choose fit and elite individuals (routes) to proliferate further
- **Route detector** *(Mar 2020 - Jun 2020)*
  - A modified implementation of the A* algorithm with a graphical user interface.
  - The program displays the shortest route, hence solving the shortest path problems of world maps.
  - It considers real-life situations which necessitates re-routing, intermediate checkpoints, obstacles, and so on.

COURSES

- IISER Kolkata Summer School on Quantum information and Quantum Technology *(Aug 2022)*
- Classical Electromagnetism-Electrostatics,Bsc.hcverma.in *(May 2020 - Dec 2020)*
- Advanced Course on Special Theory Of Relativity,Bsc.hcverma.in *(Jan 2020 - May 2020)*
- Quantum Mechanics,Bsc.hcverma.in *(Aug 2019 - Nov 2019)*

POSITIONS OF RESPONSIBILITY

- Volunteered in Organization of IISER TVM college fest Ishya *(IISER TVM, 2018 - 2019)*
- Organized the college Science fest in Birla college, Thane *(Birla College, 2018 - 2019)*

TECHNICAL SKILLS

- **Programming Languages:** C, C++, Python, HTML, IBM QISKIT, MATLAB
- **Tools and Libraries:** MATLAB, Tensorflow, OpenCV, Git

EXPERIMENTAL SKILLS

- **Lab equipments:** Zeeman effect Instrument (HOLMARC) , Hall effect (SES INSTRUMENTS), Electron spin resonance spectrometer (SES INSTRUMENTS), Optical fiber communication (BENCHMARK OPTICALS) ,SQUID magnetometer (M/s STAR CRYO ELECTRONICS) ,Thin film deposition (HIGH HIND VACCUM) ,AFM ,XRD

EXTRA-CURRICULAR ACHIEVEMENTS

- Winner of B.K Birla college Math games competition *(2019)*
- Participated in flute playing at B.K. Birla college *(2019)*
- Participated in college fest Dance competition, IISER TVM *(2022)*